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## ***A NEW CLEARER FOR COLLODIONIZED OBJECTS.***

PIERRE A. FISH, Ithaca, New York.

The advantages of cutting sections of collodion-imbedded objects in oil have been well described by Bumpus.\* For this purpose he recommends the white oil of thyme, which, on account of its paleness, renders the block of collodion as transparent as glass and admits of the most perfect orientation. Ordinary oil of thyme is often substituted for the oil of origanum. It is cheaper, and "for all the purposes for which oil of origanum was used that of thyme is not less useful, and it is more agreeable." After one distillation of the crude oil it is of a reddish-brown color and is called the *red* oil of thyme, but when again distilled it becomes colorless, and in this condition is distinguished as the *white* oil. Thymol comes over last in the process of distillation, and the white oil therefore contains much less of this valuable antiseptic than the red. The oil has a neutral reaction and is readily soluble in alcohol.

The red oil is apparently just as efficient as the white for clearing. It gives a light-brown tinge to the collodion, but renders it perfectly transparent.

Thyme oil is quite volatile, and it is very desirable, especially when one is liable to interruption, to add some fixed oil to retard evaporation. Castor-oil was tried, and the following formula was found to give the best results:

Red oil of thyme.....	3 parts.
Castor-oil .....	1 part.

If a thin film of absorbent cotton soaked in the castor-thyme oil be spread over the object, it may be left in the microtome for hours without harm.

The addition of the castor-oil is attended with several benefits. In the first place, it makes the collodion slightly flexible, so that when the sections are transferred to the slide and the superfluous oil removed they adhere more firmly to the glass and do not move

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\* American Naturalist, xxvi, p. 80, 1892.

when mounted in balsam, as occasionally happens when only thyme oil is used. There is no true action as a fixative, for the collodion is not dissolved in any way—only softened and toughened—and if alcohol be applied the oil will be displaced, the collodion hardened, and the sections will then move freely in any direction.

The edge of the knife is preserved for a longer time on account of this softening, and thinner sections may be cut. The addition of the castor-oil also lightens the color, gives more “body,” is a better lubricator, and floats the sections more readily. If the specimen is easily oriented, the block of collodion may be mounted on the object-carrier directly from the chloroform bath and the whole immersed in the clearer until the object is sufficiently transparent. The mixture is highly antiseptic, and ordinary specimens may be left in it indefinitely without shrinkage. The method has been applied to Golgi preparations with the best of results; but with these the sections should be cut as soon as, or a little before, the object is entirely clear.

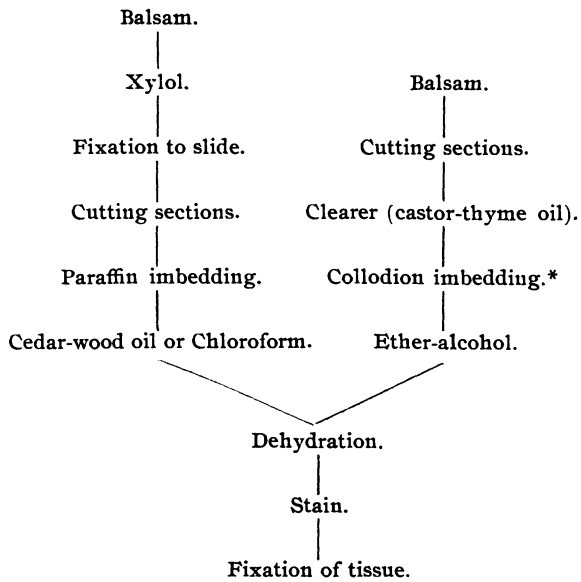
A more or less serious objection to the “oil method” is that it has been applicable only to specimens stained *in toto*. The castor-thyme oil method can be extended to section staining with equally good effects. The removal of the section or series of sections from the knife with tissue paper is to be highly recommended, as the paper supports the very thin and delicate sections, and there is no strain or risk of tearing as when the brush or needle is used. After the transfer of the sections to the slide the superfluous oil is to be absorbed with more tissue paper. A few drops of ether-alcohol (equal parts of each) are poured over them; this dissolves the collodion sufficiently to cause the sections to adhere very firmly. The slide is then placed in 95 per cent. alcohol to dissolve out any oil that may be left, and then carried through the weaker grades, 70 per cent., 35 per cent., and water. The sections are then stained, carried back through the alcohols, cleared, and mounted. If the tissue or collodion show any opacity it signifies that all of the oil has not been removed, and the preparation should go back into the strong alcohol until it becomes clear.

This method has been used satisfactorily with the small hand microtomes as well as with the large mechanical ones, and seems to be just as applicable for vegetable as for animal tissues.

Tables representing a synopsis and comparison with the paraffin method for section and bulk staining are herewith appended.

*Table for Bulk Staining,*

(To be read upward.)

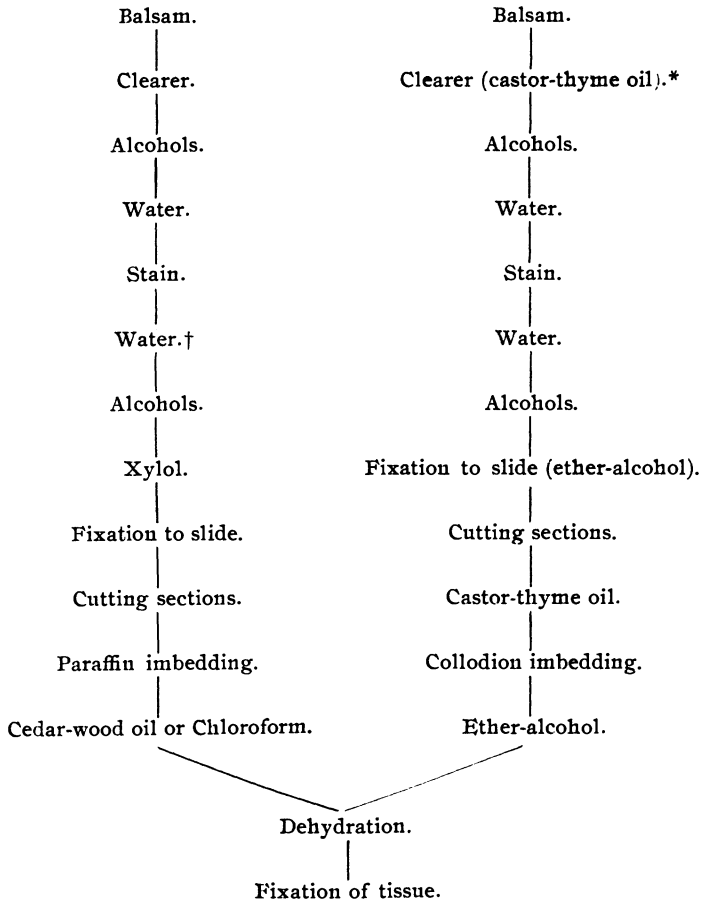



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\* Chloroform is recommended for hardening the collodion.

*Table for Section Staining.*

(To be read upward.)



\* Or Carbol-xylol the formula given by Vasale : Xylol, 3 parts ; Carbolic acid, 1 part. It clears quickly, and is useful for sections.

† If alcoholic stains are used the water is, of course, omitted.